

REMARKS

In reply to the Office Action dated December 1, 2005, Applicant has amended the title and abstract of the invention to more particularly describe the general subject matter of the invention. Applicant also has amended the specification to correct several minor informalities without adding any new matter to the originally filed disclosure. Applicant further has amended claim 6 to place it in independent format. Finally, Applicant has added new claims 8-18 to protect additional aspects of the invention. As a result of this Amendment, claims 1-18 are currently pending.

Applicant appreciates the courteous efforts of Examiner Bonk and Supervisory Examiner Banks to expedite prosecution of this application during the personal interview conducted on February 7, 2006. During the interview, Applicant proposed to make a number of claim amendments and provided a draft Amendment for discussion purposes only. Specifically, Applicant proposed to add (1) new product claims 9-26, (2) new method claims 37-44, and (3) new product-by-process claims 37-44 to protect additional aspects of the invention. In response, the Examiners indicated that the proposed new product claims 9-26 and the proposed new product-by-process claims 37-44 would be subject to a restriction requirement. The Examiners concluded that they would refuse to consider claims 9-26 and 37-44 because method claims 1-8 have already been elected by original presentation due to the issuance of the outstanding Office Action on the merits of originally filed method claims 1-8. Accordingly, Applicant has withdrawn the product claims 9-26 and the product-by-process claims 37-44 from consideration in favor of pursuing these claims in a divisional application. By this Amendment, Applicant has renumbered the elected method claims 1-8 and the proposed new method claims 27-36 discussed during the interview as pending claims 1-18.

During the interview, the Examiners also raised the issue of whether the “heat forging” feature of the proposed method claims 27-26 is described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention. The specification, however, provides ample support for the claimed “heat forging” feature. By way of example, the specification specifically states that:

“[p]referably, the aluminum alloy tube 3 is completely annealed prior to the insertion of the aluminum alloy tube 3 into the first die 4,”

(para. 26). See also original claims 4, 5, and 7. Since the original disclosure provides that the tube 3 is annealed before insertion into the first die 4, one of ordinary skill in the art would readily recognize that the tube is in a heated state during the disclosed forging step, which occurs when the tube 3 is in the first die 4. In other words, the term “heat forging” and the embodiments disclosed in the originally filed disclosure indicate that “forging” is a step which may occur while the tube is in the heated state. It bears emphasizing, however, that the illustrative embodiments disclosed in the specification should not be used to limit the literal or equivalent scope of the actual claim feature. Based on the originally filed disclosure, one skilled in the art would readily understand that the specification reasonably conveys the claimed “heat forging” feature. As a result, the specification fully complies with the requirements 35 U.S.C. § 112, first paragraph.

With respect to the prior art, the Examiners indicated that independent claim 1, distinguishes the claimed invention over the prior art of record. The Examiners also indicated that proposed claim 27, which has been renumbered as claim 9, also distinguishes the invention over the prior art of record. With these indications of

allowability in mind, Applicant believes that pending claims 1-18 are in condition for allowance.

With respect to the outstanding Office Action, the Examiner objected to the disclosure based on minor informalities. See Office Action at 2. By this Amendment, Applicant has amended the specification to obviate the Examiner's concerns. Specifically, Applicant has amended paragraph 22 of the published application, or page 5, line 9, to page 7, line 4, of the originally filed specification by changing the reference numbers "50" and "70" to --5-- and --7--, respectively. The disclosure thus fully complies with U.S. Patent Office practice.

With respect to claims 6 and 7, Applicant appreciates the Examiner's indication in the outstanding Office Action that these dependent claims would be allowable if rewritten in independent form by including all of the features of independent claim 1 therein. In response, Applicant has amended dependent claim 6 to be in independent form by including many of the features recited in independent claim 1. Claim 7 remains dependent upon claim 6. Accordingly, claims 6 and 7 are now allowable.

For the reasons discussed on pages 3-4 of the Office Action, the Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over Peet (U.S. Patent No. 2,739,376) in view of Reiche et al. (U.S. Publication No. 2002/0043089), Rempe et al. (U.S. Patent No. 6,826,943), and Otuska et al. (U.S. Patent No. 6,581,433). And, as discussed on page 5 of the Office Action, the Examiner rejected claims 3 and 4 under 35 U.S.C. § 103(a) as being unpatentable over Peet in view of Reiche et al., Rempe et al., and Otuska et al., and further in view of Lonbani (U.S. Patent No. 5,671,626).

As discussed during the interview, however, the prior art fails to render the claimed invention unpatentable. Each of the claims recite specific combinations of features that distinguish the invention from the prior art in different ways. For example, independent claim 1 recites a combination that includes, among other things:

radially and proportionally enlarging the cross-section of the thick end section of the aluminum alloy tube by forging the aluminum alloy tube in a first die using a first mandrel in such a manner that the wall thickness of the thick end section after being enlarged is substantially the same as that of the thin section,

(claim 1, ll. 7-11). Moreover, independent claim 9 recites another combination that includes:

radially and proportionally heat forging the second section of the tube from a first shape, which has a thickness that is greater than the thickness of the first section, to a second shape, which has a thickness that is less than the thickness of the first shape,

(claim 9, ll. 4-7). At the very least, Peet, Reiche et al., Rempe et al., Otuska et al., and Lonbani, whether each taken alone or in combination, fail to disclose or suggest any of these exemplary features recited in the independent claims 1 and 9.

To make out a *prima facie* case of obviousness, the Examiner must demonstrate (1) that Peet, as proposed to be repeatedly modified by the teachings of Reiche et al., Rempe et al., Otuska et al., and Lonbani, disclose or suggest each and every feature recited in the claims, (2) that there is a reasonable probability of success of such modifications, and (3) the existence of some suggestion or motivation, either in the teachings of the applied references themselves or in the knowledge generally available to one of ordinary skill in the art, to make such modification so as to result in the claimed invention. See M.P.E.P. § 2143 (7th ed. 1998). It bears emphasizing that each of these

requirements must be found in the prior art — not based on Applicant's own disclosure.

See id.

Viewed against this backdrop, each of the Examiner's factual conclusions must be supported by "substantial evidence" in the documentary record. *See In re Lee*, 61 U.S.P.Q.2d 1430, 1432 (Fed. Cir 2002). The Examiner has the burden of documenting all findings of fact necessary to support a conclusion of anticipation or obviousness "less the 'haze of so-called expertise' acquire insulation from accountability." *Id.* To satisfy this burden, the Examiner must specifically identify where support is found within the prior art to meet the requirements of 35 U.S.C. § 103. In this case, however, the Examiner has failed to satisfy his burden of demonstrating how Peet, taken alone or in combination with Reiche et al., Rempe et al., Otuska et al., and/or Lonbani, can render obvious each and every one of the limitations present in independent claims 1 and 9, as required by the Manual of Patent Examining Procedure ("MPEP") and Federal Circuit jurisprudence.

Peet discloses the use of two "forming operations to shorten one end of the blank, thicken the walls thereof, and to provide the same with a polygonal shape." Col. 1, ll. 58-60. Peet, however, fails to provide any disclosure of "radially and proportionally enlarging the cross-section of the thick end section of the aluminum alloy tube by forging the aluminum alloy tube in a first die using a first mandrel in such a manner that the wall thickness of the thick end section after being enlarged is substantially the same as that of the thin section," as stated in independent claim 1. Nor does Peet disclose or suggest "radially and proportionally forging the second section of the tube from a first shape, which has a thickness that is greater than the thickness of the first section, to a

second shape, which has a thickness that is less than the thickness of the first shape,” as recited in independent claim 9.

Instead, Peet teaches away from the claimed invention. For example, Peet discloses the use of two forming operations that **thicken** a heated end 2 of a cylindrical blank 1. Peet describes the first forming operation as follows:

The blank is then placed in a press, not shown, and a punch, not shown, is forced into the heated end 2 of the blank while the outside of the heated end is disposed in a die, not shown, of suitable configuration. The metal of the heated end is expanded by the punch until it conforms to the shape of the die and is also caused to flow or move toward the opposite or cold end 3 of the blank thereby **thickening** the walls of the heated end while simultaneously shortening the length of the same as can be seen in Fig. 2.

Col. 2, ll. 6-15 (emphasis added). Similarly, Peet describes the second forming operation as follows:

The next step in the method is a repetition of the first operation except that a tapering hexagonally-shaped punch and die are utilized to form the heated end of the blank into a hexagonal shape, to **thicken** the walls of the end being worked, and to cause additional heated metal to flow toward the opposite or cold end of the blank thereby further shortening the overall length of the same. See Figs. 3 and 4.

By contrast, independent claim 1 calls for radially and proportionally enlarging the cross-section of “the thick end section” of a tube through the use of a “first” die and a “first” mandrel. The first die and punch operation in Peet, however, are applied to a blank having a **uniform** wall thicknesses in order to **thicken** heated end 2. Moreover, independent claim 9 calls for a tube having a first section and a second section, which is structured or configured, such as by being heated, to be forged from a first shape to a second shape, which has a thickness that is **less than** the thickness of the first shape. In Peet, however, the second shape of the tube shown in Fig. 2 has a thickness that is **greater than** the thickness of the first shape shown in Fig. 1. Consequently, Peet not

only fails to disclose each and every feature recited in independent claims 1 and 9, but it also teaches away from the claimed invention.

Turning to the secondary references, Reiche et al., Rempe et al., and Otuska et al., all fail to remedy the deficiencies of Peet. For example, the Examiner relies upon Reiche et al. solely to allegedly disclose the use of “a drawing method.” Office Action at page 3. The Examiner also relies upon Rempe et al. only to ostensibly disclose “a process for expanding tubes of an aluminum material.” *Id.* at page 3. Moreover, the Examiner relies upon Otuska et al. merely to purportedly disclose the use of a “punching and pressing” process for mechanically deforming a tube. *Id.* at page 4. Modifying Peet with the teachings of Reiche et al., Rempe et al., and Otuska et al. thus would fail to overcome the shortcomings of Peet.

And with respect to dependent claims 3 and 4, Lonbani undeniably fails to supply the shortcomings of Peet. For example, the Examiner relies upon Lonbani solely to ostensibly disclose the existence of a “method of drawing a tube wherein the tube is cleaned and subsequently immersed in a lubricant medium before the drawing operation and wherein the tube is partially annealed prior to the drawing operation.” *Id.* at page 5. As such, one having ordinary skill in the art would readily recognize that each of the secondary references do not provide any suggestion or motivation for the Examiner's proposed modification of Peet. Consequently, each of the secondary references fails to remedy the deficiencies of Peet, as required by 35 U.S.C. § 103.

Moreover, even if Peet could be properly modified to result in the claimed invention, which it could not, there is no motivation for modifying this reference in the manner suggested by the Examiner. One having ordinary skill in the art at the time of

the invention would not even consider making the Examiner's imagined modifications because Peet explicitly teaches away from the claimed invention, as discussed above. Indeed, the Examiner's fictitious changes would impermissibly: (1) render Peet unsatisfactory for its intended purposes; and (2) change the principles of operation of the Peet method. The MPEP specifically states that if the "proposed modification would render the prior art unsatisfactory for its intended purpose" or "change a principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." M.P.E.P. § 2143.01 at 112-13 (7th ed. 1998). Accordingly, it is only through hindsight afforded by Applicant's own disclosure that the Examiner can even assert that the applied references suggest the claimed invention. Such hindsight determinations are impermissible under 35 U.S.C. § 103.

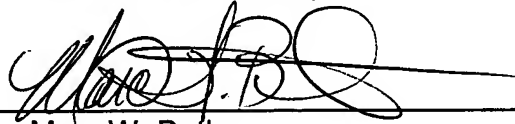
For at least these reasons, Peet, as proposed to be repeatedly modified by the teachings of Reiche et al., Rempe et al., Otuska et al., and Lonbani all fail to disclose or render obvious each and every element recited in independent claims 1 and 9. The Examiner has acknowledged that the subject matter of claims 6 and 7 is allowable. In addition, claims 2-5, 8, and 10-18, which all depend upon one of the independent claims, respectively, recite additional features that are neither disclosed nor suggested by each of the applied references, taken either alone or in combination. Since each of the dependent claims not only include the same limitations as independent claims 1 and 9, but also recite these additional limitations, they are allowable for at least the same reasons discussed above with respect to independent claims 1 and 9.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of all the pending claims 1-18. Should it be necessary to resolve any additional concerns and expedite the issuance of a Notice of Allowance, the Examiner is invited to contact Applicant's representative at (202) 408-6052.

Please grant any extension of time to the extent required to enter this response and charge any fees required to our Deposit Account No. 06-0916.

Respectfully submitted,

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By: 
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Dated: February 28, 2006

Attachments: Appendix A: Clean Copy of Substitute Abstract
 Appendix B: Marked Up Copy of Substitute Abstract